

## CLAIMS

### WHAT IS CLAIMED IS:

1. A three dimensional air cushion comprising:  
at least one air chamber having a sealed peripheral edge and a geometric shape,  
a hollow area surrounded by said sealed peripheral edge, and  
a projected area of said hollow area being smaller than a surface area of said air cushion.
2. A three dimensional air cushion comprising:  
at least one air chamber having a sealed peripheral edge and a geometric shape,  
and  
an inner surface area of said air cushion being smaller than an outer surface area of said air cushion.
3. A three dimensional air cushion comprising:  
at least two air chambers communicating with each other, and  
at least one elongated recessed groove separating said air chambers, said at least one elongated recessed groove having two ends, each of said two ends having a surface extending generally vertically to a projected elevational surface of said at least one recessed groove.
4. The three dimensional air cushion as claimed in claim 1, wherein said at least one air chamber has two opposite sides extending upward to have an upper end with a higher level than an intermediate portion of said at least one air chamber.
5. The three dimensional air cushion as claimed in claim 2, wherein said at least one air chamber has two opposite sides extending upward to have an upper end with a

higher level than an intermediate portion of said at least one air chamber.

6. The three dimensional air cushion as claimed in claim 3, wherein said at least two air chambers have two opposite sides extending upward to have an upper end with a higher level than an intermediate portion of said at least two air chambers.

7. The three dimensional air cushion as claimed in claim 1, wherein said at least one air chamber is sealed.

8. The three dimensional air cushion as claimed in claim 2, wherein said at least one air chamber is sealed.

9. The three dimensional air cushion as claimed in claim 3, wherein said at least two air chambers are sealed.

10. The three dimensional air cushion as claimed in claim 1, wherein said air chamber has a one-way valve to communicate with open air.

11. The three dimensional air cushion as claimed in claim 2, wherein said air chamber has a one-way valve to communicate with open air.

12. The three dimensional air cushion as claimed in claim 3, wherein said air chambers have a one-way valve to communicate with open air.

13. The three dimensional air cushion as claimed in claim 1, wherein an upper surface is provided with at least one recessed elongated groove and a lower surface is flat and smooth.

14. The three dimensional air cushion as claimed in claim 2, wherein an upper

surface is provided with at least one recessed elongated groove and a lower surface is flat and smooth.

15. The three dimensional air cushion as claimed in claim 3, wherein an upper surface is provided with at least one recessed elongated groove and a lower surface is flat and smooth.

16. The three dimensional air cushion as claimed in claim 1, wherein a lower surface is provided with at least one recessed elongated groove, and a upper surface is flat and smooth.

17. The three dimensional air cushion as claimed in claim 2, wherein a lower surface is provided with at least one recessed elongated groove, and a upper surface is flat and smooth.

18. The three dimensional air cushion as claimed in claim 3, wherein a lower surface is provided with at least one recessed elongated groove, and a upper surface is flat and smooth.

19. The three dimensional air cushion as claimed in claim 1, wherein an upper surface and a lower surface are provided with at least one recessed elongated groove.

20. The three dimensional air cushion as claimed in claim 2, wherein an upper surface and a lower surface are provided with at least one recessed elongated groove.

21. The three dimensional air cushion as claimed in claim 3, wherein an upper surface and a lower surface are provided with at least one recessed elongated groove.

22. The three dimensional air cushion as claimed in claim 19, wherein said

elongated recessed grooves provided in said upper surface and lower surface are connected with each other.

23. The three dimensional air cushion as claimed in claim 20, wherein said elongated recessed grooves provided in said upper surface and lower surface are connected with each other.

24. The three dimensional air cushion as claimed in claim 21, wherein said elongated recessed grooves provided in said upper surface and lower surface are connected with each other.

25. The three dimensional air cushion as claimed in claim 1, wherein said air cushion is a component in one of a shoe, a sneaker, a protective pad, and a helmet, for providing a buffer and shock-absorbing effect.

26. The three dimensional air cushion as claimed in claim 2, wherein said air cushion is a component in one of a shoe, a sneaker, a protective pad, and a helmet, for providing a buffer and shock-absorbing effect.

27. The three dimensional air cushion as claimed in claim 3, wherein said air cushion is a component in one of a shoe, a sneaker, a protective pad, and a helmet, for providing a buffer and shock-absorbing effect.

28. The three dimensional air cushion as claimed in claim 1, further including an inlet for filling fluid.

29. The three dimensional air cushion as claimed in claim 2, further including an inlet for filling fluid.

30. The three dimensional air cushion as claimed in claim 3, further including an inlet for filling fluid.

31. The three dimensional air cushion as claimed in claim 28, further including a valve device.

32. The three dimensional air cushion as claimed in claim 29, further including a valve device.

33. The three dimensional air cushion as claimed in claim 30, further including a valve device.

34. The three dimensional air cushion as claim in claim 28, further including a pump device.

35. The three dimensional air cushion as claim in claim 29, further including a pump device.

36. The three dimensional air cushion as claim in claim 30, further including a pump device.

37. The three dimensional air cushion as claims 28, wherein said air chamber is filled with a liquid fluid.

38. The three dimensional air cushion as claims 29, wherein said air chamber is filled with a liquid fluid.

39. The three dimensional air cushion as claims 30, wherein said air chambers are filled with a liquid fluid.

40. The three dimensional air cushion as claimed in claim 28, wherein said air chamber is filled with semi-liquid fluid.

41. The three dimensional air cushion as claimed in claim 29, wherein said air chamber is filled with semi-liquid fluid.

42. The three dimensional air cushion as claimed in claim 30, wherein said air chambers are filled with semi-liquid fluid.

43. The three dimensional air cushion as claimed in claim 28, wherein said air chamber is filled with foam material.

44. The three dimensional air cushion as claimed in claim 29, wherein said air chamber is filled with foam material.

45. The three dimensional air cushion as claimed in claim 30, wherein said air chambers are filled with foam material.

46. The three dimensional air cushion as claimed in claim 28, wherein said air chamber is filled with a gas other than air.

47. The three dimensional air cushion as claimed in claim 29, wherein said air chamber is filled with a gas other than air.

48. The three dimensional air cushion as claimed in claim 30, wherein said air chambers are filled with a gas other than air.

# PATENT COOPERATION TREATY

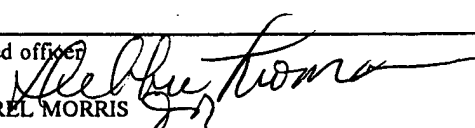
## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P60998W00</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/US97/09742</b>	International filing date ( <i>day/month/year</i> ) <b>04 JUNE 1997</b>	Priority date ( <i>day/month/year</i> ) <b>NONE</b>
International Patent Classification (IPC) or national classification and IPC <b>IPC(6): A43B 7/08 and US Cl.: 36/3 B, 3 R</b>		
Applicant <b>HUANG, ING-JING</b>		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>5</u> sheets.</p> <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step or industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul>
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Date of submission of the demand  <b>02 JANUARY 1998</b>	Date of completion of this report  <b>27 JULY 1998</b>
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231  Facsimile No. (703) 305-3230	Authorized officer  <b>TERREL MORRIS</b>  Telephone No. (703) 308-2351

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US97/09742

**I. Basis of the report**

1. This report has been drawn on the basis of *(Substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments):*

- ☐ the international application as originally filed.
- ☒ the description, pages (See Attached) , as originally filed.  
pages \_\_\_\_\_ , filed with the demand.  
pages \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.  
pages \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. (See Attached) , as originally filed.  
Nos. \_\_\_\_\_ , as amended under Article 19.  
Nos. \_\_\_\_\_ , filed with the demand.  
Nos. \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.  
Nos. \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig (See Attached) , as originally filed.  
sheets/fig \_\_\_\_\_ , filed with the demand.  
sheets/fig \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.  
sheets/fig \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE.
- ☒ the claims, Nos. 4-6.
- ☒ the drawings, sheets/fig NONE.

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the ~~Supplemental Box~~ Additional observations below (Rule 70.2(c)).

4. Additional observations, if necessary:

NONE



## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US97/09742

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>1-3 and 7-48</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-3 and 7-48</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-3 and 7-48</u>	YES
	Claims <u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-3 and 7-48 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the newly amended feature of a U-shaped air passage extending out of the plane of the cushion. Claims 1-3 and 7-48 meet the criteria set out in PCT Article 33(4) for industrial applicability since the inventions would find utility in the shoe industries.

**----- NEW CITATIONS -----**

US 5,117,566 A (LLOYD et al.) 02 June 1992, see Drawings.

US 4,670,995 A (HUANG) 06 June 1987, see Drawings.

US 4,183,156 A (RUDY) 15 January 1980, see Abstract and Drawings.

US 4,219,945 A (RUDY) 02 September 1980, see Abstract Drawings and columns 3-6.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US97/09742

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

**I. BASIS OF REPORT:**

This report has been drawn on the basis of the description,  
pages, 1-6, as originally filed.  
pages, NONE, filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the claims,  
numbers, 30-48, as originally filed.  
numbers, NONE, as amended under Article 19.  
numbers, NONE, filed with the demand.  
and additional amendments:  
Claims 1-3 and 7-29, filed with the letter of 18 June 1998.

This report has been drawn on the basis of the drawings,  
sheets, 1/9-9/9, as originally filed.  
sheets, NONE, filed with the demand.  
and additional amendments:  
NONE

## PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF RECEIPT OF  
RECORD COPY

JUL 25 1997 (PCT Rule 24.2(a))

To:

HOLMAN, John, Clarke  
Jacobson, Price, Holman & Stern  
The Jenifer Building  
400 Seventh Street, N.W.  
Washington, DC 20004  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 16 July 1997 (16.07.97)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P60998WO0	International application No. PCT/US97/09742

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

- ✓ HUANG, Ing-Jing (all designated States)  
✓ IDEA INC. (for all designated States except US)

International filing date : 04 June 1997 (04.06.97)

Priority date(s) claimed :

Date of receipt of the record copy  
by the International Bureau : 14 July 1997 (14.07.97)

List of designated Offices :

AP : GH, KE, LS, MW, SD, SZ, UG

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

EP : AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

OA : BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

✓ National : AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU,  
IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,  
SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU

## ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase;  
☐ confirmation of precautionary designations;  
☐ requirements regarding priority documents.

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

Ting Zhao

Telephone No. (41-22) 338.83.38

### INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiry of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

**For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.**

Note that since ES is not bound by PCT Chapter II (which provides for the international preliminary examination procedure), that State cannot be elected in a demand for international preliminary examination. In the case of the designation of ES for a national patent, the applicant must thus always enter the national phase before the national Office of that State before the expiration of 20 months from the priority date. In the case of the designation of ES for a European patent, however, the 31-month time limit applies in respect of that designation if at least one other State designated for a European patent is also elected within the 19-month period.\*

Note also that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

- \* CH and LI became bound by PCT Chapter II on 1 September 1995. GR became bound by PCT Chapter II on 7 September 1996. Therefore, CH and LI may be elected in a demand or a later election filed on or after 1 September 1995, and GR may be elected in a demand or a later election filed on or after 7 September 1996, regardless of the filing date of the international application. (See 2nd paragraph above.)

### CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

### REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents the following is recalled.

Where the priority of an earlier national (i.e., national or regional) application is claimed, the applicant must submit a copy of the said national application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date (Rule 17.1).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such a request must be made before the expiration of the 16-month time limit.

It is recalled that, where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

If the priority document concerned is not submitted to the International Bureau before the expiration of the 16-month time limit, or if the request to the receiving Office to transmit the priority document has not been made (and the corresponding fee, if any, paid) before the expiration of this time limit, any designated State may disregard the priority claim.

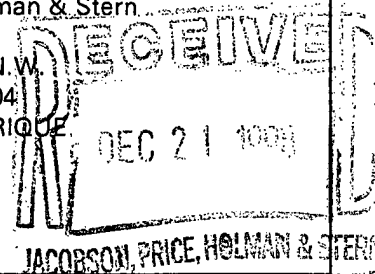
## PATENT COOPERATION TREATY

12-28-98  
PCTNOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

HOLMAN, John, Clarke  
Jacobson, Price, Holman & Stern  
The Jenifer Building  
400 Seventh Street, N.W.  
Washington, DC 20004  
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 10 December 1998 (10.12.98)		IMPORTANT NOTICE	
Applicant's or agent's file reference P60998WO0			
International application No. PCT/US97/09742	International filing date (day/month/year) 04 June 1997 (04.06.97)	Priority date (day/month/year)	
Applicant HUANG, Ing-Jing et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AU, BR, CA, CN, EP, IL, JP, KP, KR, PL, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:  
AL, AM, AP, AT, AZ, BA, BB, BG, BY, CH, CU, CZ, DE, DK, EA, EE, ES, FI, GB, GE, GH, HU, IS, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, OA, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU  
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 10 December 1998 (10.12.98) under No. WO 98/54995

**REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)**

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

**REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))**

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38